PhytoKeys

PhytoKeys 247: 183–190 (2024)
DOI: 10.3897/phytokeys.247.130721

Research Article

# *Pothos deleonii* (Araceae, Potheae, Pothoideae), a new species from Bukidnon, Mindanao, Philippines

Maria Melanie P. Medecilo-Guiang[1,2], Derek Cabactulan[3]

1 *Center for Biodiversity Research and Extension in Mindanao, Central Mindanao University, University Town, Musuan, Maramag, Bukidnon 8714, Philippines*
2 *Plant Biology Division, Institute of Biological Sciences, College of Arts and Sciences, Central Mindanao University, University Town, Musuan, Maramag, Bukidnon 8714, Philippines*
3 *48 Corrales and 1st Streets, Nazareth, Cagayan de Oro City, Misamis Oriental 9000, Philippines*

*Corresponding author: Maria Melanie P. Medecilo-Guiang (lanie_medecilo@yahoo.com, f.mariamelanie.medecilo@cmu.edu.ph)*

## Abstract

A new species of *Pothos* is described and illustrated. This species is very similar to *Pothos philippinensis* (sheathing and leaf morphology) but differs by the inflorescence and flowers. It is closely related also to *P. kingii* by the deep purple inflorescence, but differs in having longer peduncle, broadly ovate-concave to cucullate spathe (which is deep wine-red when fresh to purplish-black when senescing), and the spadix that is 7/10$^{th}$ the entire length of the spathe.

**Key words:** Allopothos, Araceae, aroid diversity, critically endangered, endemic, *Pothos philippinensis*

OPEN ACCESS

**Academic editor:** Duilio Lamonico
**Received:** 28 June 2024
**Accepted:** 30 September 2024
**Published:** 15 October 2024

**Citation:** Medecilo-Guiang MMP, Cabactulan D (2024) *Pothos deleonii* (Araceae, Potheae, Pothoideae), a new species from Bukidnon, Mindanao, Philippines. PhytoKeys 247: 183–190. https://doi.org/10.3897/phytokeys.247.130721

**Copyright:** © Maria Melanie P. Medecilo-Guiang & Derek Cabactulan.
This is an open access article distributed under terms of the Creative Commons Attribution License (Attribution 4.0 International – CC BY 4.0).

## Introduction

*Pothos* L. (Araceae Juss., Pothoideae, Potheae ; Mayo et al. 1997; Cusimano et al. 2011; Chartier et al. 2014; Haigh et al. 2022) is a genus comprising 65 species (WCPV 2024) distributed in subtropical to tropical regions from Madagascar to Oceania, China to Australia with Borneo as the center of diversity (Boyce 2000; Boyce and Hay 2001; Wong and Boyce 2019). Morphologically, it includes forest-dwelling hemiepiphytes (Zots 2013; Zots 2020; Zots et al. 2021a, 2021b) with bisexual flowers (Linnaeus 1753). Recently, a number of new species were recorded in Asia (Nguyen et al. 2017; Wong and Boyce 2019; Rajkumar et al. 2020; Wong et al. 2020) and the latest is the new combination, *P. venustus* (Wall. ex C.DC.) A.Hay & P.C.Boyce in Malesia (Hay and Boyce 2022).

In the Philippines, a total of eight species [*P. cylindricus* C. Presl, *P. dolichophyllus* Merr., *P. inaequilaterus* (C. Presl) Engl., *P. insignis* Engl., *P. luzonensis* (C. Presl) Schott, *P. ovatifolius* Engl., *P. philippinensis* Engl., and *P. scandens* L.] have been recorded (Boyce and Hay 2001) of which four are endemic (Pelser et al. 2011). Two species (*P. insignis* and *P. ovatifolius*) are confined in Borneo, Sulawesi, Sumatera, Malay Peninsula, and Philippines, while *P. scandens* is widely distributed in Asia and other South-East Asian regions. The last complete revision of *Pothos* including the Philippine species was published by Boyce and Hay (2001). Subsequently, no additional species of *Pothos* from the Philippines has been published.

During bird expeditions in 2019 by Dr. Miguel De Leon, he observed a species of aroid with very striking inflorescence in one of the Robert S. Kennedy Bird Conservancy conservation sites in Bukidnon. The plant was collected because of its unique and regal inflorescence. Last February of 2024, this new species was again observed and photographed *in situ*. The original collection and fresh material were sent for further examination by the authors. Morphologically, the observed plants are distinct and do not match with any described species of *Pothos*. As a consequence, we here propose to describe a new species for science.

## Material and methods

The voucher specimens were collected from the type locality last February 18, 2024 with Gratuitous Permit R-102024-22. Specimens were processed using the methods of Bridson and Forman (1999) and deposited at the herbaria **PNH**, and **CMUH** (acronyms according to Thiers 2024, continuously updated). Detailed photographs and a description were taken from fresh materials in the field using a digital camera. Taxonomic identification was based on morphological vegetative and reproductive characters following the aforementioned literature.

## Taxonomic treatment

***Pothos deleonii*** **M.P.Medecilo-Guiang & D.Cabactulan, sp. nov.**
urn:lsid:ipni.org:names:77350292-1
Figs 1, 2

**Type.** PHILIPPINES • Bukidnon Province, Manolo Fortich date: February 18, 2024, MPMG1005 (holotype PNH! PNH259023); isotypes CMUH!)

**Diagnosis.** This new species is morphologically similar to *Pothos philippinensis* based on vegetative characters but differs by the purplish peduncle, dark wine red to purplish black spathe and pendulous peduncle and acuminate to caudate (vs. acuminate to apiculate) leaf apex. *P. deleonii* is closest to *R. kingii* and *P. atropurpurascens* M. Hotta by having a purple cylindrical spadix but differs from 2 later species by having a much longer, purplish green to dark purple peduncle, 16–18 cm long (vs 5 cm long in *P. kingii* and 8 cm in *P. atropurpurascens*) broadly ovate spathe, subsessile spadix and 7/10 the entire length of the spathe, bigger diameter of flowers (2 mm) and flower orientation.

**Description.** Plant growth glabrous, root climbing, fibrous liana. **Stem** moderate slender, slightly woody, terete, green, internodes 2 cm long by 7 mm in diameter in juvenile stage and 7 cm long by 3 mm in diameter upon maturity, younger shoots arising above from the base of the half of the entire length of older stem. **Roots** present along stem when juvenile, fewer to absent towards the terminal shoots with inflorescence. **Leaves** spreading, long petiolate, petiole slender angular, 45 degree angled towards the stem, 6–15 cm long by 4–12 mm in diameter, petioles deeply canaliculate with petiolar sheath prominently distinct, erect extending to pulvinus and imbricate to the stem, base decurrent, apex prominently geniculate, petiolar sheath apically ligulate in young growth, ligule and sheath margins later scarious-disintegrating, 7–14 cm long by 0.6–2.5 mm wide, 7/8 of the entire length of the petiole. **Lamina** oblong-lanceolate, occasionally falcate, asymmetrical, coriaceous, margins entire, flat-

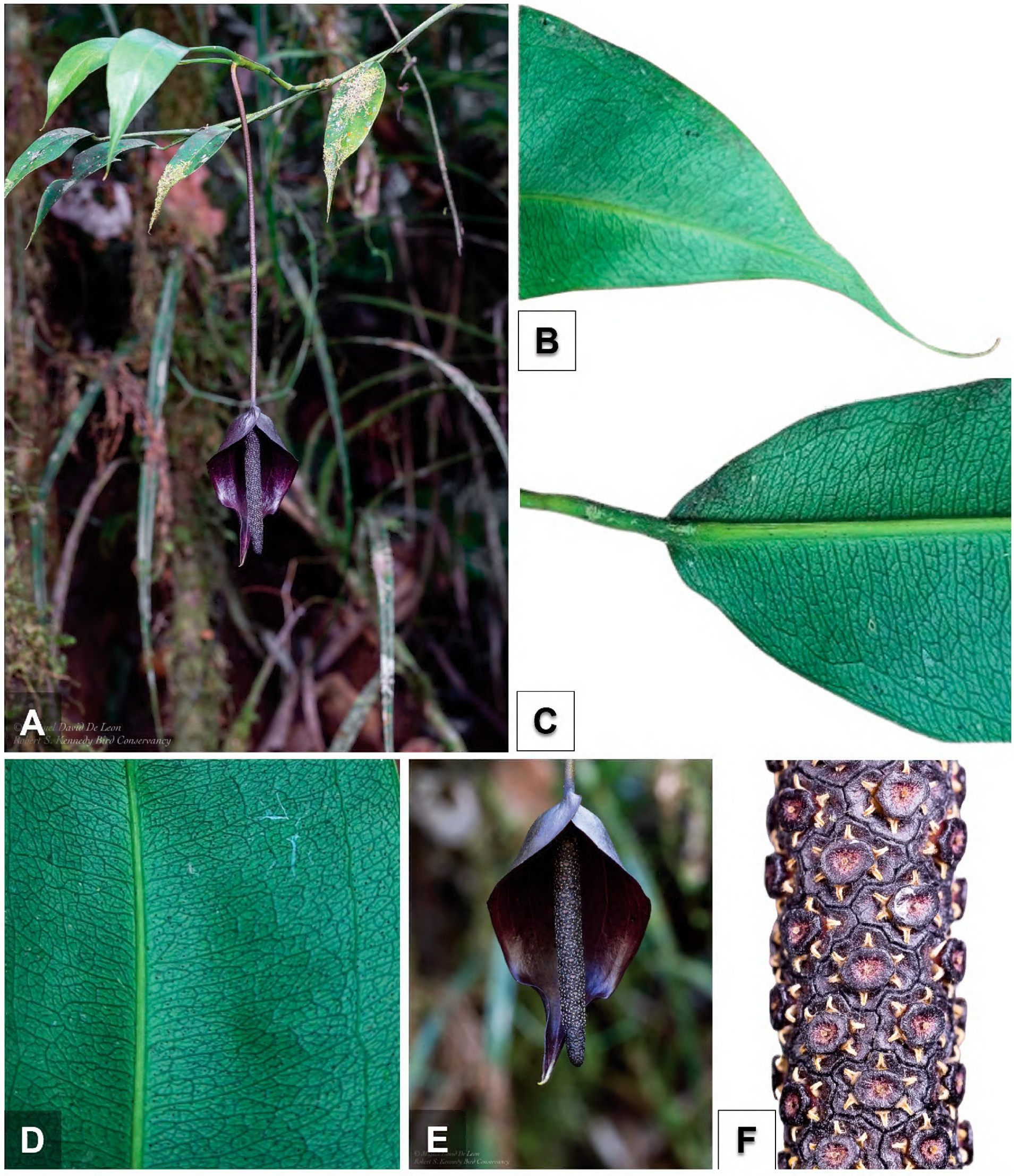


**Figure 1.** *Pothos deleonii* M.P Medecilo-Guiang and D. Cabactulan **A** habit with flowering branch **B** leaf apex **C** leaf base **D** venation pattern **E** inflorescence **F** detail of spadix.

tened, shallowly sinuate to slightly conduplicate, 15.5–26.3 cm long by 4–6 cm wide, apex acuminate to caudate and thickened, base acute to obtuse, slightly cordate in juvenile stage, adaxially slightly glossy, dark green and abaxially pale green. Venation closely pinnate, brochidodromous, midrib pale green, adaxially flattened and abaxially rounded raised, primary lateral veins arising running at the base of midrib towards the intra-marginal veins, secondary veins arising at each primary lateral vein, close-spaced disorganized reticulated towards

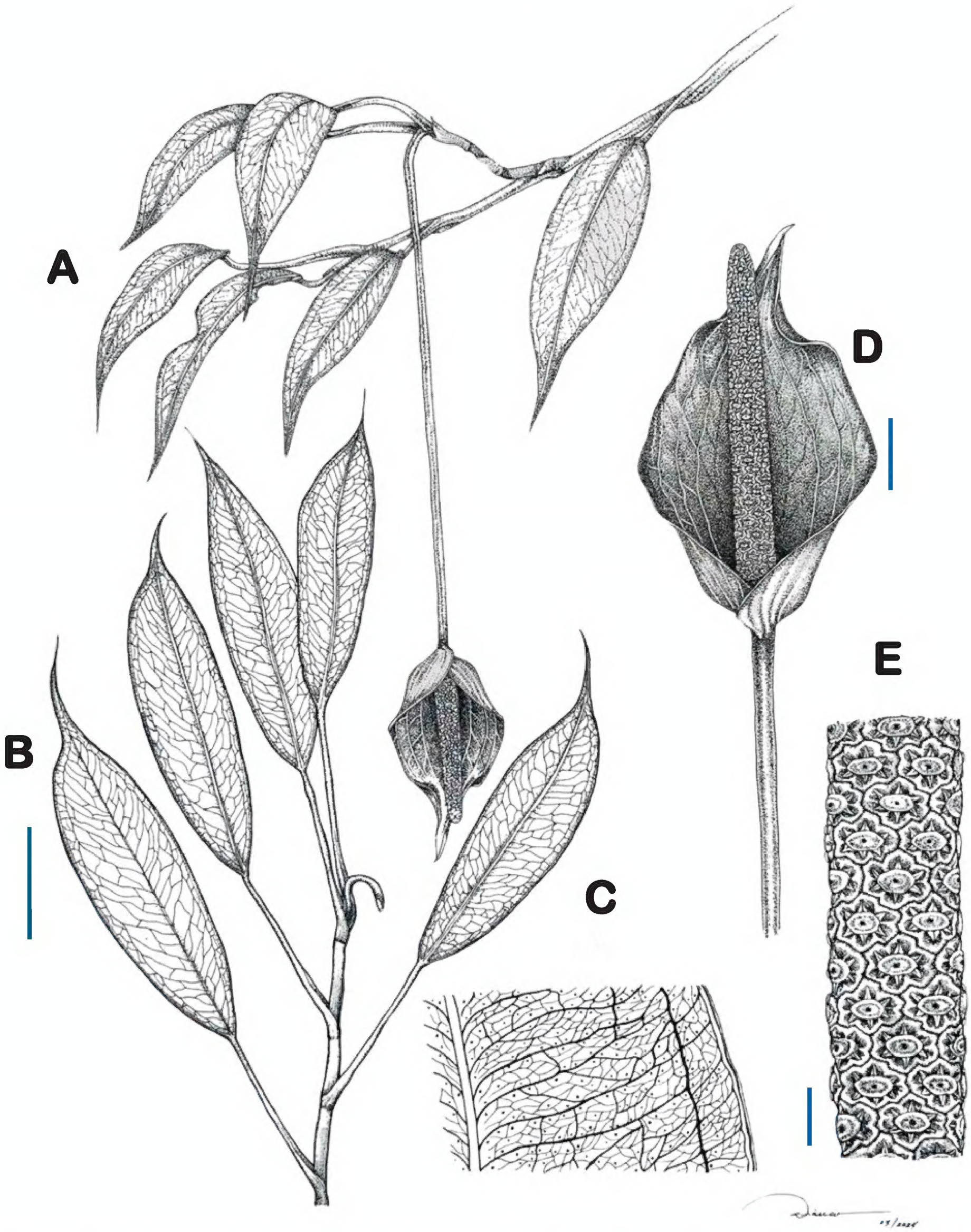


**Figure 2.** Line drawing of *Pothos deleonii* **A** whole plant **B** leaf phyllotaxy **C** venation pattern **D** Inflorescence **E** detail of spadix: Scale bars: 10 mm (**B**); 15 mm (**D**); 5 mm (**E**).

the intra-marginal vein, 2 intra-marginal veins on both sides of the leaf, arising from the base of midrib towards the apex, disorganized reticulated, primary intra-margins 6.5–9.0 mm wide, secondary intra-margins 0.8–1.0 mm wide, venation adaxially less prominent to absent when fresh and slightly present

when dry, abaxially prominent visible in both fresh and dry state, intra-marginal veins raised abaxially when dry, outer intramarginal vein remaining very close and parallel to margin. **Inflorescence** solitary, elongated, deflexed, pendent, and arising from each terminal of matured stem, positive geotropic. **Peduncle** long terete, stout, deflexed, base purplish-green, dark purple towards the base of the spathe, 16–18 cm long by 2–3 mm in diameter. **Spathe** broadly ovate, concave to cucullate, apex acuminate, curved, base cordate and slightly decurrent on the peduncle, dark wine red when fresh and purplish black when near wilting, 9.2–10.0 cm long and 4.5–5.5 cm wide, softly-leathery when fresh and papery when dried, prominently 9-nerved, veins dirty white when fresh and dark purplish black when dried, less prominent acrodomous venation. **Spadix** long cylindrical, stout, subsessile, dark purplish, 6.4–6.9 cm long by 3.5–4.0 mm in diameter, 7/10 the entire length of the spathe, flower c. 2.7 mm, tepals 1 mm by 0.70 mm, oblong-cymbiform, dark purplish-black, apex fornicate, triangular, truncate, minutely 3–4-lobed, flower compressed angular-ellipsoid, black purplish, stylar region truncate, centrally depressed, 1.5 mm in diameter, stigma prominently punctiform, stamens, 0.3 mm long by 0.1 mm wide, filaments strap-shaped, thecae c. 0.2 mm in diameter, creamy yellow, ovary 1.0–1.6 mm high by 0.25–0.70 mm in diameter, fertile zone 5.2–5.8 cm long, appendix 8–11 mm long. Infructescence not observed.

**Ecology and habitat.** Known only in a highly restricted area in two sites in degraded secondary, open-canopy dipterocarp forest in a 500-hectare avian conservation site located at the northern foothills of Mt. Kitanglad, 1,150 and 1,270 m a s l. The plant grows from the ground or at the base of trees (*Shorea* sp.) and trunk of *Alsophila* sp., 12–20 cm dbh; adherent to host plants from the ground to 4–6 meters, at which plants become branched and grow freely, either pendent or supported by vines or branches of adjacent trees. No specific association with plants other than host plants can be gleaned. But the habitat is favorable to other aroids like *Alocasia sanderiana*, *A. zebrina*, and *Rhaphidophora* sp.

**Distribution.** Philippines. BUKIDNON: Manolo Fortich, (exact location withheld as a conservation measure).

**Vernacular.** None recorded.

**Etymology.** The specific epithet honors Dr. Miguel David De Leon, a vitreoretinal surgeon and wildlife conservationist, who first photographed the species *in situ*, and supports the conservation of wild flora, particularly orchids and hoyas, and fauna, specifically raptors, in Mindanao.

**Uses.** No known usage in traditional medicine; potentially valuable in horticulture.

**Conservation status.** Extensive survey in the 500-hectare area revealed only 12 mature individuals. Because the plants are located in an avian conservation site and constantly monitored by the Robert S. Kennedy Bird Conservancy, there are currently no threats. However, due to its small population and highly restricted extent of occurrence (less than 2 hectares), this species is considered as Critically Endangered based on the criteria of IUCN (2024).

**Notes.** *P. deleonii* belongs to subgenus *Allopothos* under the *Pothos barberianus* group and it is closely related to the Philippine endemic *P. philippinensis* and two Malaysian species: *P. kingii* and *P. atropurpurascens* but differs in the size, shape, color and orientation of other floral segments (Table 1).

**Table 1.** Morphological comparison of *P. deleonii*, *P. philippinensis*, *P. kingii* and *P. atropurpurescens*.

| | ***Pothos deleonii*** | ***P. philippinensis*** | ***P. kingii*** | ***P. atropurpurascens*** |
|---|---|---|---|---|
| **Leaves** | | | | |
| **Color** | dark green | drying dull greenish brown | bright to mid-green | midgreen |
| **midrib** | pale green | slightly paler green | slightly paler green | pale yellow |
| **blade shape** | adaxially flattened and adaxially raised | ovate to oblong elliptic or narrowly lanceolate | prominently raised | slightly raised |
| **base** | oblong lanceolate, occasionally falcate | rounded, rarely truncate or cordate | ovate to elliptic or lanceolate | ovate-elliptic to narrowly oblong elliptic or oblanceolate |
| **apex** | acute to obtuse, slightly cordate | acute to long attenuate | acute to rounded | acute to obtuse |
| **primary lateral** | acuminate to caudate | apiculate | acute or attenuate | rounded and abruptly cuspidate, minutely apiculate |
| **veins** | arising at 85–90° | arising at c. 45° | 45–65° | 65–80° |
| **Peduncle** | deflexed ca. 90° at base | nodding to deflexed | reflexing held inverted | reflexed c. 90° at base |
| **Spathe shape** | broadly ovate concave to cucullate | triangular, subcucullate | ovate, deeply cucullate | ovate, deeply cucullate |
| **apex** | acuminate | long-acuminate | acute | acute to attenuate |
| **color** | dark wine red to dark purple | pale green | deep purple inside and out | white stained purple |
| **Spadix** | subsessile | sessile but basally decurrent on spathe | sessile | sessile |
| **color** | dark purple | paler green | deep purple-brown | deep purple gray |
| **Flowers** | ca. 2.7 mm | c. 1.3 mm | 1 mm | 1.2 mm |

## Acknowledgements

We would like to thank the Robert S. Kennedy Bird Conservancy for funding research and conservation. The authors are also indebted to the Department of Environment and Natural Resources Region X for the Wildlife Gratuitous Permit and Central Mindanao University (CMU) Future's Thinking Project (FLR-NSRC). We are also grateful to Larie Dianco, artist/illustrator from the Philippine National Museum for his wonderful and excellent illustration.

## Additional information

### Conflict of interest

The authors have declared that no competing interests exist.

### Ethical statement

No ethical statement was reported.

### Funding

This paper was made possible through the generous funds of Dr. Miguel David De Leon and the Robert S. Kennedy Bird Conservancy. CMU Funds For Later Release (FLR-NSRC) were also used during the fieldwork in the type locality.

### Author contributions

Conceptualization: MMPM-G, DC; Collection: MMMG; Data Collection: MMPM-G, DC; Formal analysis: MMPM-G, DC; Funding acquisition: MMPM-G.

## Author ORCIDs

Maria Melanie P. Medecilo-Guiang https://orcid.org/0000-0003-1584-1585
Derek Cabactulan https://orcid.org/0009-0001-4087-5595


## Data availability

All of the data that support the findings of this study are available in the main text.

# References


Boyce PC (2000) The genus *Pothos* (Araceae – Pothoideae – Potheae) of Thailand and Indochina. Blumea 45(1): 147–204.

Boyce PC, Hay A (2001) A taxonomic revision of Araceae Tribe Potheae (*Pothos*, *Pothoidium*, *Pedicellarum*) for Malesia, Australia and the tropical western Pacific. Telopea 9(3): 449–572. https://doi.org/10.7751/telopea20024002

Bridson DM, Forman L (1999) The Herbarium Handbook 3rd Edition. Royal Botanic Gardens Kew, Kew, 346 pp.

Chartier M, Gibernau M, Renner SS (2014) The evolution of pollinator/plant interaction types in Araceae. International Journal of Organic Evolution 68(5): 1533–1543. https://doi.org/10.1111/evo.12318

Cusimano N, Bogner J, Mayo SJ, Boyce PC, Wong SY, Hesse M, Hetterscheid WLA, Keating RC, French JC (2011) Relationships within the Araceae: Comparison of morphological patterns with molecular phylogenies. American Journal of Botany 98(4): 654–668. https://doi.org/10.3732/ajb.1000158

Haigh AL, Gibernau M, Maurin O, Bailey P, Carlsen MM, Hay A, Leempoel K, McGinnie C, Mayo S, Morris S, Pérez-Escobar OA, Yeng WS, Zuluaga A, Zuntini AR, Baker WJ, Forest F (2022) Target sequence data shed new light on the infrafamilial classification of Araceae. American Journal of Botany 110(2): e16117. https://doi.org/10.1002/ajb2.16117

Hay A, Boyce PC (2022) *Pothos venustus* – a new combination in West Malesian Araceae based on *Piper venustum* Wall. Aroideana 45(1): 259–266.

IUCN (2024) Guidelines for using the IUCN Red List categories and criteria. Version 16: Prepared by the Standards and Petitions Committee on March 2024.

Linnaeus C (1753) Species Plantarum Vol. 2. Laurentii, Holmiae, 560 pp.

Mayo SJ, Bogner J, Boyce PC (1997) The Genera of Araceae. Royal Botanic Gardens Kew, Kew, 370 pp.

Nguyen VD, Nguyen VD, Boyce PC (2017) *Pothos vietnamensis* sp. nov. (Araceae-Pothoideae-Potheae) from Vietnam. Nordic Journal of Botany 35(3): 276–280. https://doi.org/10.1111/njb.01434 [ISSN 1756-1051]

Pelser PB, Barcelona JF, Nickrent DL [Eds] (2011) [onwards] Co's Digital Flora of the Philippines. https://www.philippineplants.org [Accessed September 2024]

Rajkumar G, Shaju T, Nazarudeen A, Prakashkumar R (2020) *Photos boyceanus* (Araceae), a new species from the Western Ghats, India. Taiwania 65(2): 114–118.

Thiers B (2024) [continuously updated] Index Herbariorum: A global directory of public herbaria and associated Staff. New York Botanical Garden's Virtual Herbarium. http://sweetgum.nybg.org/science/ [Accessed September 2024]

WCVP (2024) World Checklist of Vascular Plants. https://wcvp.science.kew.org [Accessed September 2024]

Wong SY, Boyce PC (2019) Studies on Potheae of Borneo I: *Pothos pugnax*, a new species of *Pothos* [Allopothos: *Pothos barberianus* group] from Kuching Division, Sar-

awak, Malaysian Borneo. Webbia 74(2): 259–264. https://doi.org/10.1080/00837792.2019.1639107

Wong SY, Joling J, Pereira JT, Boyce PC, Hay A (2020) Studies on Potheae (Araceae) of Borneo II: *Pedicellarum* M. Hotta subsumed into *Pothos* L., and recognition of three new species. Webbia 75(1): 89–103. https://doi.org/10.36253/jopt-7944

Zots G (2013) 'Hemiephyte': A confusing term and its history. Annals of Botany 111(6): 1015–1020. https://doi.org/10.1093/aob/mct085

Zots G (2020) Life forms in aroids – Natural variability vs. terminological confusion. Aroideana – Journal of the International Aroid Society 43(1&2): 315–333.

Zots G, Almeda F, Arias S, Hammel B, Pansarin E (2021a) Do secondary hemiepiphytes exist? Journal of Tropical Ecology 37(6): 286–290. https://doi.org/10.1017/S0266467421000407

Zots G, Almeda F, Bautista-Bello AP, Eskov A, Giraldo-Canas D, Hammel B, Harrison R, Köster N, Krömer T, Lowry PP, Moran RC, Plunkett GM, Weichgrebe L (2021b) Hemiephytes revisited. Perspectives in Plant Ecology, Evolution and Systematics 51: 125620. https://doi.org/10.1016/j.ppees.2021.125620